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ABSTRACT

One experiment investigated the relationship of goal setting and locus of control to the work performance of mentally retarded adults and a second experiment was a semi-replication study done on college adults. Two main effects were studied: (1) Method of goal setting (whether a worker set his own goal, had a goal set by a supervisor, or simply observed his own production without setting a goal); and (2) locus of control (whether the subject's locus of control was internal or external). In the first experiment, 48 mentally retarded workers completed a simple task. Setting goals as opposed to not having goals did make a positive difference in production, but it seemed immaterial whether the individual or the supervisor set the goal. Locus of control made no significant difference. A second study was conducted on college students, with the expectation that subjects of higher intelligence would show differences when setting their own goals as opposed to having goals set for them. When 64 university students performed a simple clerical task, neither goal setting nor locus of control seemed to affect performance. The failure to get this result with the college students and the limited effect with the retarded subjects suggest that whether goal setting does or does not improve performance is a function of several factors, including difficulty of task and environmental conditions, and that the relationship between locus of control and work performance is more complex than had previously been thought. (LMS)

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GOAL SETTING AS A FACILITATOR OF WORK PERFORMANCE OF RETARDED ADULTS AND COLLEGE STUDENTS DIFFERING IN LOCUS OF CONTROL

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The accelerating trend towards automation in our highly industrialized, technological culture has resulted in a decrease in the number of unskilled jobs of the type usually open to mentally retarded workers (Gardner & Gardner, 1973). One extremely important variable in whether or not a retarded worker is judged "successful" or "unsuccessful" by his employer on-the-job is the retarded worker's production rate (Chafin, 1969). In order for the retarded worker to compete successfully in a decreasing job market, vocational educators need to attend to developing new and improved methods that will ensure that retarded workers develop work skills and production capabilities beyond those of the unskilled laborer.

In a lengthy discussion on vocational preparation of the retarded, Wolfensberger (1967) suggested that

> ...the application of learning principles to workshop practices constitutes a fertile field for research...the use of...new ways to encourage work towards goals, (and) the translation of external rewards into internal ones...needs to be studied (p. 252).

Research into increasing work production of retarded workers through the systematic application of methods for encouraging work is crucial. Personality variables may be important in such increases. The relationship between goal setting and the internal-external locus of control personality variable which lends itself to exploration through the application of Rotter's Social Learning

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Theory (1954, 1966, 1971, 1975), appears to be a viable area for producing relevant information on this topic.

According to Rotter's theory (1954):

> The occurrence of a behavior of a person is determined not only by the nature or importance of the goals or reinforcements but also by the person's anticipation or expectancy that these goals will occur. (p. 102)

Moreover, such behavior

> ...depends upon whether or not the person perceives a casual relationship between his own behavior and the reward. A perception of casual relationship need not be all or none but can vary in degree (1966, p. 1).

In other words, the behavior of a person is affected in part by the extent to which a person believes that reinforcements are contingent on his own behavior; one who believes that reinforcements are contingent on his own behavior, capacities or attributes is said to have an internal locus of control (ILC), whereas a person who believes that reinforcements are not under his own personal control but rather are under the control of powerful others or may be attributed to "luck," "chance," or "fate" is said to have external locus of control (ELC).

This study investigated the relationship of goal setting and locus of control on the work performance of mentally retarded adults with a semi-replication study done on college adults.

Experiment I

Hypotheses:

All hypotheses were based in Rotter's Social Learning Theory. Hypotheses were: (1) The mean production of goal setting workers will be significantly greater than production of those who do not set goals. (2) The mean production of goal setting workers with internal locus of control will be significantly greater than the mean production of goal setting workers with external locus of control. (3a) The mean production of goal setting workers with internal locus of control who set their own goals will be significantly higher than the

production of their counterparts who have their goals set for them. (3b) The mean production of the goal setting workers with external locus of control who have their goals set for them will be significantly higher than the production of their counterparts who set their own goals.

Method

Subjects were 48 mentally retarded adult workers (Mean IQ = 51.1; Mean Age = 27.5 years). All retarded workers were clients in the same vocational training facility and were selected from an original list of 61 clients. Clients whose physical handicaps made it impossible for them to perform the task and clients whose parents refused permission for them to participate in the study were eliminated.

Locus of Control Scale

Locus of control was determined by a slightly modified form* of the Bialer-Cromwell Children's Locus of Control Scale (Bialer, 1961; Gardner, Warren & Gardner, in press). Test-retest reliability on this modified form was reported as .78 (Pearson r). Reliabilities on similarly modified forms have been reported as .89 (Miller, J., 1962), .94 (Miller, M., 1960) and .73 (McConnel, 1962). Most studies using the Bialer scale report Pearson product-moment coefficients in the seventies to nineties (e.g., Bialer, 1961; Gozali & Bialer, 1968; Gardner, Warren & Gardner, in press).

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* Modification consisted of substituting the word "kids" for "children" because in the adult population studied the term "kid" was used by workshop clients to refer to themselves and to each other.

Bialer (1961), using this scale, found internal locus of control positively correlated (.86) with willingness to delay gratification to obtain a larger future reward in retardates. This tendency was confirmed in a more recent study by Kelman (1972). In a study involving experimentally induced failure, McConnell (1962) found that a mild failure experience did not influence locus of control scores in retardates and that scores are relatively stable in spite of discouraging environmental events. Shipe (1971) reports Bialer scores significantly correlated with grades in arithmetic, reading, mean achievement and with behavior rating scales in 46 retarded clients in a vocational training facility. Gardner, Warren & Gardner (in press) predicted and found Bialer scores significantly correlated (.37) with knowledge of layman's law in a group of high school normal, retarded and learning disabled students. Brubakken (1972) found the scale positively correlated with "incidental" learning in retarded persons and Gozali and Bialer (1968) found the scale to be free from response-set bias.

Thus, the scale appears to be a reliable, stable and valid instrument. The scale was administered in this study by using tape recorded presentation of items, a procedure described by Gozali & Bialer (1968).

Experimental Design

The study used a 2x3 factorial design which permitted a direct determination of the two main effects as well as their interactions. Main effects studied were: (1) Method of goal setting, whether or not a worker set his own goal or had his goal set for him or simply observed his own production rate (knowledge of results, no goal setting); (2) Internal-external locus of control, whether or not the client's locus of control was internal or external.

The dependent variable was the mean production score of each group per shift for the total experimental period. Only completed work of acceptable quality standards was counted; about 98% of the production met quality standards each day.

The Task

The work consisted of a simple labeling task in which the workers affixed a blue and white label (7/8 x 4 inches) to a flat surface area above the "window" area of a red and yellow, printed cardboard bacon cover (6-5/8 x 11-1/4 inches). Task consisted of two simple operations: (1) Remove label from a roll of labels, and (2) Align and place label, gum side down, on the cover in the designated area.

Assignment to Treatment Groups

Following procedures of many investigators studying locus of control in retarded and non-retarded populations, the total experimental population was divided into two equal groups using a median split technique (Barron & Ganz, 1972; Brubakken, 1972; Lawrence, 1969; Lefcourt et al, 1968; Rotter and Mulray, 1965). Median locus of control for the group was 14.49; mean score 13.83, s.d. 3.85. These averages are consistent with those reported by previous investigators.

Prior to assignment to groups, clients were given a time study to determine the mean normal production over three shifts for each client. Then, clients were matched on the basis of locus of control and production (time study) into experimental triplets. From the triplets, clients were randomly assigned to treatment groups: No goal setting, setting own goals for performance, and supervisor set goals. When t tests were applied to the six groups (ILC-no-goals, ILC-self goals, ILC-supervisor goals, ELC-no-goals, ELC-self goals, ELC-supervisor goals) there were no significant differences among the groups on mean, time study, production scores. The six groups were randomly assigned to shifts on a daily basis and supervisors were randomly assigned to shifts for each day in order to ensure that the same supervisor was not consistently assigned to the same client.

The experiment was run over five days, six shifts per day, thus giving each client five production sessions.

Experimental Treatments:

On the first experimental day at the beginning of his shift, the worker was told what his performance (mean) had been on the time study. On succeeding experimental days, they were told the results of the previous day's performance. Before beginning the task, the no-goal setting group was merely told to begin working. The self-goal setting group was asked to set their own goals. The supervisors set goals 5% over the previous day's production for each worker in the third group. In order to avoid problems of failure to understand numbers, a two inch wide measuring tape was provided with sections (of the height of 25 packages) and with numbers marked on it and the supervisor pointed to the place representing the number (and section), stating the number, and asking the worker to point to the level he expected to reach on the upcoming trail. The tape markings were set at approximately the height of the number of packages which would represent the numbers by sections on the goal setting tape.

Thus, each worker in the goal setting groups knew what was "expected" either by himself or by the supervisor for his performance. Prior to beginning the experimental treatment, supervisors were trained in the procedure and memorized the wording for stating goals or requesting them. ("You got ___ yesterday. How many do you expect to do today. Show me." or "Today I expect you to do ___." (pointing to level and number).

RESULTS

No differences were found by supervisors, intelligence (within this narrow range), sex of worker, or extreme scorers on the locus of control measure.

Production results are shown in Table 1. Analysis of variance is shown in Table 2. Main effect for locus of control was not significant. The F test barely failed to reach significance at the pre-selected level of .05 for goal setting and

so Dunnett's t test was used to compare the combined goal setting groups with the no-goal setting group (see Kimmel, 1970, p. 160; Roscoe, 1969, pp. 241-2). Dunnett's t was 2.03, p=.05. Using gain scores, two way ANOVA indicated also a significant F (F=3.912, p=.05) for the goal setting main effect. Thus, it was concluded that setting goals as opposed to not giving goal setting instructions did make a positive difference in production, but it seemed immaterial whether the individual set his own goal or had the goal set by the supervisor. The goal setting results are supported by the previous work with retarded individuals (Gardner & Gardner, in press; Kliebhan, 1967; Warner & DeJung, 1969) and with non-retarded persons (Armstrong, 1947; Fryer, 1964; Kausler, 1959; Lockette, 1956). The results are also consistent with Rotter's theory concerning goal setting, but not the theory as it relates to locus of control.

Experiment II

College Students

The results of Study I showed no differences between those who set goals for themselves and those who had goals set for them. This could have been due to the well known tendency of retarded persons to be compliant and it was hypothesized that this effect may have been related to that factor. If so, then subjects of higher level intelligence would be expected to show such differences when setting their own goals as opposed to having goals set for them.

Subjects for Study II were 64 university students in three different private colleges in the Boston area. Two of the universities tend to draw students from the upper middle class and the third draws primarily from the lower middle class.

Hypotheses were essentially the same as for the first study but the task was chosen to be more likely to appeal to college students. The task was modeled after many clerical tasks used by experimental psychologists, that is, crossing

out every letter of every word on a page. The page consisted of a random selection of words chosen from the Thorndike & Lorge (1944, 1968) List of the 500 Words Occuring Most Frequently in the English Language. All words were typed in capital letters with a primer typewriter (about 14 point type) to ensure ease of seeing and working. Two equivalent forms of the task were developed and counterbalanced in presentation. General instructions for the task were written on the first page of a booklet. The second page contained the task, trial 1. Each student was given 90 seconds to work on the task and then asked to count the number of words completed. (Pages were marked with numbers of letters cummulative at the end of each line to facilitate counting.) Students recorded the score obtained for trial 1 on the third page of the booklet. Below the space for recording score were instructions to set goals for the next trial. For self-goal setters the instructions were to "state your expected score on the next test."

For the second goal setting group, students were instructed to set a goal 10% higher than the score on the first trial. For the no-goal setting group, students were simply instructed to record the score for trial 1 and begin the task again when the experimenter gave the time signal. The final pages on all booklets contained the Rotter's locus of control scale (1966). Reliabilities of Rotter's scale are well established; both the Rotter adult scale and the Bialer-Cromwell children's locus of control scale were developed from the same early prototype scales (See James, 1957).

The booklets were given out to students who were in 8 intact classes at the universities. In order to randomize assignment of conditions, the booklets were stacked in random order and handed out to the students as they appeared in rows in the room. All students were told that this was a volunteer activity and they might leave the classroom if they did not wish to participate. Assignment to

locus of control conditions depended on score on the LC scale. Thus, there are unequal numbers of subjects in the various cells for analysis. The scale was scored to ensure that high scorers would be Internals and low ones Externals. Because it was hypothesized that those in the middle of the scale on locus of control might differ from Externals and Internals, the groups established were Internal, (High LC Scores), Middle (Middle LC Scores) and External (Low LC scores).

Results

The ANOVA for gain scores between trial 1 and trial 2 is shown in Table 3. No main effects were significant, but the goal setting effect approached significance. Therefore, the two goal setting groups were combined and compared with the no-goal setters, with a resulting *t* of .264, N.S. Comparisons of the goals setters who were instructed to set 10% goals with the self goal setters yielded a *t* of .599, N. S.

Because it seemed likely that the failure to get significant differences may have been related to the simplicity of the task, a correlated *t* test was computed between trial 1 and trial 2 for the Control group and resulted in *t* of 9.44, $p = .001$, suggesting that the hypothesis of practice effect might be feasible. For the goal setting groups combined, correlated *t* between trial 1 and trial 2 was 13.17, $p = .001$. No differences were found by university groups or by sex.

Discussion

Results of the first study suggest that goal setting seems to have an effect on production rate of retarded adult workers on a simple work task. For a simple task given to college students, neither goal setting nor locus of control seemed to affect performance. One possibility for the improvement in scores on trial 2 over trial 1 for college students is practice effect on a very easy task. (In fact, correlation between trial 1 and trial 2 was .80 for all groups combined).

Another possibility may be that a college classroom setting for students who probably have high ambitions already may have led to internal goal setting in all groups whether or not they were given instructions. However, the mean gain for the Control (no goal setting) group was 42.31 (S.D. 17.93) letters and the mean gain for the combined goal setting groups was 43.98 (S.D. = 23.13) and so the practice effect hypothesis seems more tenable.

That goal setting does tend to increase performance on some tasks for both retarded subjects and normal ones has already been demonstrated by previous investigators. The failure to get the result with the college students and the limited effect with the retarded ones suggests that whether goal setting does or does not improve performance is a function of several factors, including difficulty of task, environmental conditions, and probably other personality variables.

The failure to demonstrate relationships between locus of control and work performance on either of these groups, although it has shown moderate relationships with such activities as reading achievement, incidental learning and willingness to delay gratification for a larger future reward suggests that this concept is more complex than had previously been suggested. Rotter has suggested that there are limitations in methods of measurement of locus of control and that those with External locus of control are not a homogeneous group (Rotter, 1975). At this point, the matter is unclear and one can only say that locus of control appears not to be a very important factor in simple work tasks.

TABLE 1

Means, Standard Deviations for Age, L C, I Q, Average Production Time Study and Average Product Treatment Scores of Treatment Groups

Group (N=8 for each group)	Age (Months)	L C	I Q	Mean Prod. per Shift: Time-Study	Mean Prod. per Shift: Treat-ment	Mean Prod. per Shift: Trans-formed Gain Scores
Group A (ILC/EGS)	297.00 44.90	16.88 1.27	60.88 16.03	53.63 19.98	85.88 32.90	62.38 24.35
Group B (ILC/NGS)	312.00 37.54	17.38 1.11	52.25 8.51	48.75 24.36	57.65 24.72	36.38 16.75
Group C (ILC/IGS)	345.75 66.07	16.38 .99	47.25 11.05	50.38 25.61	75.20 33.05	54.75 48.62
Group D (ELC/IGS)	306.38 52.18	10.75 2.44	41.88 7.96	50.62 27.17	77.87 51.00	57.25 28.38
Group E (ELC/NGS)	353.13 67.66	10.00 2.78	57.86 12.76	58.00 32.49	68.45 42.73	29.25 16.75
Group F (ELC/EGS)	368.13 118.76	11.63 3.77	46.38 18.28	51.00 22.79	82.08 32.48	61.00 26.13
Total All Groups	330.40 3.85	13.83 3.85	51.08 14.59	52.06 25.87	74.51 38.27	50.17 31.56

ILC/EGS = Internal Locus of Control/Extrinsic Goal-setting.
ILC/NGS = Internal Locus of Control/No-Goal-Setting.
ILC/IGS = Internal Locus of Control/Intrinsic Goal-Setting
ELC/IGS = External Locus of Control/Intrinsic Goal-Setting
ELC/NGS = External Locus of Control/No-Goal-Setting.
ELC/EGS = External Locus of Control/Extrinsic Goal-Setting

TABLE 2

Analysis of Variance of Mean Production of External Locus of Control Versus Internal Locus of Control Subjects Under Three Goal-setting Conditions.

SOURCE	SUM OF SQUARES	df	MEAN SQUARE	F
Locus of Control (LC)	3.41339	1	3.41339	.0801, NS
Goal-Setting (GS)	5987.55859	2	2993.779	2.2152, NS
Interaction (LC x GS)	85.222	2	42.61099	.0315, NS
Within Sets	56761.79297	42	1351.47711	
TOTAL	62837.98047	47		

TABLE 3

Analysis of Variance of Mean Production Gain Scores* of External Locus of Control Versus Middle Locus of Control Versus Internal Locus of Control Subjects Under Goal-Setting Conditions

	ss	df	Mean Square	f	P
lc	464.204	2	232.102	.48	.62
gs	2147.828	2	1073.914	2.23	.11
lsxgs	1502.604	4	375.651	78	.54
error	26498.914	55	481.789		
TOTAL	30613.55	63			

* All gain scores were transformed to positive integers by adding a constant of 11.

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